

**AGENDA**  
**Satellite Observations of the Global Water Cycle**  
**March 7-9, 2007**  
**Beckman Center of the National Academies, Irvine, CA**

**Wednesday, March 7, 2006**

- 07:30-08:30 Breakfast
- 08:30-08:45 Opening Remarks  
    Jay Famiglietti, UCI, Logistics, Welcome on behalf of UCI  
    Randy Friedl, JPL, Welcome on behalf of JPL  
    Eni Njoku, JPL, Workshop goals
- 08:45-09:20 Rick Anthes, UCAR, Earth Science and Applications from Space: A Community Assessment and Strategy for the Future

**Session 1: The Global Water Budget, Adam Schlosser, Chair; Sean Swenson, Rapporteur**

- 09:20-09:55 Kevin Trenberth, NCAR, Global water budget estimates and uncertainties
- 09:55-10:15 Don Chambers, UT Austin, Measuring variations in mean ocean mass
- 10:15-10:35 Eric Rignot, JPL, Cryospheric changes and uncertainties
- 10:35-11:15 Poster viewing and coffee break
- GWB1**  
G. R. Brakenridge, E. Anderson, S. V. Nghiem, T. De Groot, and Z. Kugler  
Microwave sensing of global river runoff
- GWB2**  
S. V. Nghiem, et al.  
Global observations of land surface water with satellite active and passive microwave sensors
- GWB3**  
K-W. Seo, D. E. Waliser, and B. Tian  
Evaluation of global fresh water discharge from land to oceans using multi-remote sensors
- GWB4**  
J. Benveniste and P. Berry  
Global monitoring of inland surface water using multi-mission satellite radar altimetry
- GWB5**  
I. Velicogna and J Wahr  
Ice sheets contribution to the global water budget
- GWB6**  
J. Famiglietti, D. Chambers, I. Velicogna, F. Frappart, S. Nerem and M. Rodell  
Mass changes in Earth's global water reservoirs from GRACE,
- GWB7**  
T. Syed, J. Famiglietti, V. Zlotnicki and M. Rodell  
Estimates of freshwater discharge from GRACE
- GWB8**  
C.K. Shum, Hyongki Lee, Yuchan Yi, and Tinjin Zhang  
Study of Permafrost Mass Changes Using GRACE and Satellite Altimetry
- GWB9**  
W. Timothy Liu and Xiaosu Xie

Spacebased estimation of moisture transport in oceanic and continental water balance

**GWB10**

P. Houser and J. Entin

The NASA Energy and Water Cycle Study

**GWB11**

J. Roads

GEWEX Water and Energy Budget Studies

**GWB12**

C. A. Schlosser and NASA Energy and Water-cycle Study (NEWS) Water-Budget Integration Team

The NASA Energy and Water-Cycle Study (NEWS) Global Water-Budget Synthesis

11:15-12:00 Discussion

12:00-13:30 Lunch break (lunch served from 12:00 to 13:00)

**Session 2: Atmospheric Hydrometeorology, Phil Arkin, Chair; Steve Margulis, Rapporteur**

13:30-14:05 Chris Kummerow, CSU, Observing global precipitation - TRMM, GPM and beyond

14:05-14:25 Graeme Stephens, CSU, New insights on the hydrological cycle of Earth: Early results from Cloudsat

14:25-14:45 David Noone, University of Colorado, Assessment and long-term monitoring of the hydrologic cycle with space-based isotope observations

14:45-16:00 Coffee and poster viewing

**AH1**

R. Adler, G. Gu, and G. Huffman

Variations in global and regional precipitation over the last 28 years.

**AH2**

W. S. Olson, M. Grecu, and C.-L. Shie

Estimation of Precipitation and Latent Heating Distributions from a Combined Analysis of Passive Microwave and Spaceborne Radar Observations

**AH3**

F. Ishak-Boushaki, K. Hsu, and S. Sorooshian

An approach to integrate satellite- and ground-based precipitation measurements for hydrologic forecasting

**AH4**

A. Behrangi, K. Hsu, and S. Sorooshian

A bi-spectral algorithm for day-time precipitation detection

**AH5**

L. Shi and J. J. Bates

Intersatellite calibrated long-term time series of the upper tropospheric water vapor

**AH6**

E. Fetzer

A Merged Satellite Atmospheric Water Data Set for Hydrology Studies

**AH7**

D. Waliser, F. Li, C. Woods, J. Jiang, A. Tomkins, D. Vane, G. Stephens, J. Bacmeister, and J. Chern

Cloud ice water: new observations and modeling challenges

**AH8**

N. J. Livesey, J. W. Waters, M. L. Santee, and P. C. Stek

The Scanning Microwave Limb Sounder (SMLS) instrument concept

### AH9

D. Noone, J. Worden, K. Bowman, and D. Brown  
Assessment and long-term monitoring of the hydrologic cycle with space-based isotope observations

16:00-17:00 Discussion

18:00-21:00 Reception, Hyatt Regency Newport Beach, Bay Pool 1

## Thursday, March 8, 2006

07:30-08:30 Breakfast

### Session 3: Terrestrial Hydrology, Christa Peters-Lidard, Chair; Wade Crow, Rapporteur

08:30-09:05 Eric Wood, Princeton, Using remote sensing for continental-scale water budget studies

09:05-09:25 Jay Famiglietti, UC Irvine, Hydroclimatology of terrestrial water storage from GRACE

09:25-09:45 Matt Rodell, NASA/GSFC, Mapping terrestrial evapotranspiration at regional to global scales

09:45-11:00 Coffee and poster viewing

#### TH1

D. Alsdorf, E. Rodriguez, and D. Lettenmaier  
Measuring surface water from space

#### TH2

B. M. Fekete, D. M. Bjerklie, C. Birkett, R. Braswell, and C. J. Vörösmarty  
Surveying and monitoring river systems using satellite remote sensing: A theoretical basis for the instrument requirements with special focus on the emerging wide swath altimeters

#### TH3

P. Kosuth, N. Bercher, and V. Frontera  
Actual accuracy of satellite radar altimetry measurement of inland water levels : still over one meter for large rivers

#### TH4

N. Mognard, M. Grippa, S. Biancamaria, and T. Le Toan  
Variability of surface water extent in central Siberia during the 1988 to 2003 summers

#### TH5

B. Kiel, D. Alsdorf, and T. Pavelsky  
Along stream profiles of Ohio river discharge from satellite elevation mapping

#### TH6

J. Hamski, D. Alsdorf, T. Pavelsky, and G. LeFavour  
Estimating water slope in Amazon river tributaries using the Shuttle Radar Topography Mission digital elevation model

#### TH7

D. Alsdorf, P. Bates, J. Melack, M. Wilson, and T. Dunne  
Spatial and temporal dynamics of the Amazon flood wave

#### TH8

H. Lee, C.K. Shum, Y. Yi, M. Ibaraki, and F. Schwartz  
Decadal Louisiana wetland water level change from retracked TOPEX radar altimetry

#### TH9

Y.H. Kerr, P. Waldteufel, and A Hahne  
The SMOS mission current status

#### TH10

J. Shi

Soil moisture estimation with AMSR-E

**TH11**

I. J. Davenport, M. J. Tribbeck, and R. J. Gurney

Passive microwave soil moisture retrieval errors arising from scene heterogeneity

**TH12**

O. Merlin, J. Walker, R. Panciera, J. Kalma, E. Kim, and J. Hacker

The National Airborne Field Experiments: Towards 1 km resolution soil moisture

**TH13**

E.Kim, M. Tedesco, J. P. Walker and R. Panciera, Observed spatial variability of snow and soil moisture signatures from the CLPX-1 and NAFE'05 campaigns

**TH14**

J. Dozier, J. E. Frew, and T. H. Painter

Space-time series of MODIS snow cover products

**TH15**

N. Molotch, M. Durand, and S. Margulis

Merging complementary remote sensing datasets in the context of snow water equivalent reconstruction

**TH16**

Jiancheng Shi and Don Cline

Snow Water Equivalence Retrieval Using Dual Frequency and Polarization Radar

**TH17**

Y. Chen, C.K. Shum, D. Alsdorf, and B. Schaffrin

Regional hydrologic signal recovery using GRACE line-of-sight gravity difference observations

**TH18**

M. Rodell, J. Famiglietti, H. Kato, B. Zaitchik, and L. Gulden

Estimating seasonal to interannual groundwater variability using GRACE

**TH19**

S. Swenson and J. Wahr

Monitoring human impacts on the water cycle

**TH20**

J. Kim and T. S. Hogue

MODIS-based daily potential evaporation estimates

11:00-12:00 Discussion

12:00-13:30 Lunch break (lunch served from 1200 to 1300)

**Session 4: Prediction Challenges, Robert Gurney, Chair; Jeffrey Walker, Rapporteur**

13:30-14:05 Louis Uccellini, NWS/NCE, Prediction and assimilation challenges for hydrometeorological operational applications: An NCEP perspective

14:05-14:25 Matthias Drusch, ECMWF

14:25-14:45 Soroosh Sorooshian, UC Irvine, Hydrometeorological prediction requirements

14:45-16:00 Coffee and poster viewing

**PC1**

M.F. McCabe and E.F. Wood

Identifying hydrological feedback and consistency through multi-sensor observation of the water cycle

**PC2**

J Schaake

The Hydrologic Ensemble Prediction Experiment (HEPEX)

**PC3**

R. Reichle

Land data assimilation in the NASA/GMAO system

**PC4**

S. Lee, James McPhee, B. Forman, and S. Margulis

Estimation of high-resolution ensemble surface forcing fields using a multi-scale remote sensing data assimilation approach

**PC5**

R. Pipunic, J. Walker, C. Trudinger, and A. Western

Heat flux data assimilation for improved land surface modelling – A one-dimensional field data case study

**PC6**

M. J. Tribbeck and R. J. Gurney

Snow-SVAT modelling as a diagnostic tool

**PC7**

M. Durand and S.. Margulis

Issues of scale in evaluating the feasibility of snow water equivalent estimation via radiance assimilation

**PC8**

K. Andreadis, E. Clark, D. Lettenmaier, and D. Alsdorf

Prospects for river discharge and depth estimation through assimilation of swath-altimetry into a raster-based hydraulics model

**PC9**

M. Thyer and J. Walker

A Bayesian approach to characterizing uncertainty in remotely sensed soil moisture measurements using the NAFE dataset

**PC10**

R. Panciera, J. P. Walker, J. D. Kalma, and E. J.Kim

Scaling properties of passive microwave soil moisture signatures during NAFE'05

**PC11**

R. H. Reichle, R. D. Koster, P. Liu, S. P. P. Mahanama, E. G. Njoku, and M. Owe

Comparison and assimilation of global soil moisture retrievals from AMSR-E and SMMR

**PC12**

D. Ryu, W. T. Crow, and X. Zhan

Assimilation of Coarse-Scale Satellite Soil Moisture Observations into a Fine-Scale Hydrologic Model

**PC13**

C. Draper, P. Steinle, and J. Walker

Soil moisture data in NWP

**PC14**

C. D. Peters-Lidard, D. M. Mocko, J. A. Santanello, Jr., M. A. Tischler, M. S. Moran, M.Garcia, and Y. Wu

The role of precipitation uncertainty for soil property estimation using soil moisture retrievals in a semi-arid environment

**PC15**

M. Hui Lo, P. J.-F. Yeh, and J. S. Famiglietti

Impact of water table dynamics on hydrological simulation of the NCAR CLM

**PC16**

G. Goteti, J. Famiglietti, K. Asante, G. Niu and Z-L. Yang, A Catchment-based hydrology and routing model system (CHARMS)

16:00-17:00 Discussion

19:30 Dinner, Cost \$45 per person all inclusive, Caspian Restaurant (Persian), 14100 Culver Dr, Irvine, 92604, (949) 651-8454

## Friday, March 9, 2006

07:30-08:30 Breakfast

### **Session 5: An Integrated Framework for Global Water Cycle Observation and Assessment, Peter van Oevelen, Chair; Matt McCabe, Rapporteur**

08:30-09:05 Taikan Oki, University of Tokyo, Current and future perspectives on world water resources

09:05-09:25 Paul Houser, GMU, Water cycle data integration, assimilation & utilization

09:25-09:45 Dennis Lettenmaier, U. Washington, Incorporating the effects of anthropogenic manipulation of the water cycle in macroscale hydrologic modeling

09:45-11:00 Coffee and poster viewing

#### **IF1**

W. Crow, J. Bolten, and X. Zhan

Exploiting potential synergies between spaceborne rainfall and surface soil moisture retrievals

#### **IF2**

P. Houser, D. Belvedere, B. Imam, R. Schiffer, C.A. Schlosser, H. Gupta, C. Welty, C. Vorosmarty, D. Matthews, and R. Lawford  
WaterNet: The NASA Water Cycle Solutions Network

11:00-12:00 Discussion

12:00-13:30 Lunch break (lunch served from 1200 to 1300)

### **Session 6: Implications of the Decadal Survey, Jay Famiglietti, Eni Njoku, Duane Waliser, Co-Chairs**

13:30-14:00 Dennis Lettenmaier, U. Washington, Implications of the decadal review for hydrology

14:00-14:30 Dara Entekhabi, MIT, Frontiers and challenges in remote sensing of global hydrology

14:30-14:45 Jared Entin, NASA, Comments from the NASA perspective

14:45-15:00 Rick Lawford, UMBC, Comments from a multi-national perspective

15:00-15:15 Coffee break

15:15-16:15 Discussion on implications of the survey for global water cycle science

16:15-17:00 Wrap-up and next steps

17:00 Adjourn